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Prevalence Rates and Factor Analysis of DSM-IV Specific Phobia Types

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Prevalence Rates and Factor Analysis of DSM-IV Specific Phobia Types

BY

Sarah P. Kerrick

THESIS

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Prevalence Rates and Factor Analysis of DSM-IV Specific Phobia Types

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Abstract

The Object and Situation Anxiety Survey (OSAS) was factor analyzed in a sample of 288 undergraduate participants. The OSAS is directly derived from DSM-IV (1994) criteria for specific phobia using the 5 diagnostic criteria across the 4 DSM-IV (1994) phobia types (animal, natural environment, blood-injection-injury, and situational), plus social phobia. Five reliable factors were derived from the OSAS that included each of the DSM-IV (1994) phobia types and social phobia. Prevalence rates for each phobia type were as follows: animal type (2.1%), natural-environment type (3.5%), blood-injection-injury type (6.6%), situational type (2.4%), and social phobia (8.7%). The prevalence of any type of phobia was 18.8%. In addition to these statistical measures, four case studies were analyzed regarding assessment of life impairment in specific phobia, animal type.

Dedication

To Peter Parker . . . wherever she may be.

Acknowledgements

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Prevalence Rates and Factor Analysis of DSM-IV Specific Phobia Types

Phobia is characterized as an unreasonable fear that causes avoidance of feared objects or situations to an extent that interferes with a person's life. According to the Diagnostic and Statistic Manual of Mental Disorders, fourth edition (APA, 1994), specific phobia is different from extreme fear when "avoidance, fear or anxious anticipation of encountering a phobic stimulus interferes significantly with the person's daily routine, occupational functioning, or social life, or if the person is markedly distressed about having the phobia" (p.405). This most recent edition of the DSM provides five criteria for the diagnosis of a specific phobia

1. Marked and persistent fear that is excessive or unreasonable, and is cued by the presence of or anticipation of the feared stimulus.
2. Exposure almost invariable provokes an immediate anxiety response, which may take the form of a situationally bound panic attack.
3. Person recognizes response is excessive and unreasonable.
4. Phobic situation is avoided when possible.
5. Response interferes with normal routine, occupational or academic functioning, or social activities or relationships, or there is marked distress about having the phobia. (p. 410)

The changes in the diagnostic criteria from simple phobia in DSM-III-R (APA, 1987) to specific phobia in DSM-IV (1994) were for the most part minor changes. Yet one significant alteration is the requirement in DSM-IV (1994) that the 'type' of specific phobia be specified from one of the following categories:

> Animal Type: Fear is cued by animals or insects
>
> Natural Environment Type: Fear is cued by situations in the natural environment, such as storms, heights, or water.
>
> Blood-Injection-Injury Type: Fear is cued by invasive medical procedures, receiving or seeing an injection, injury or blood.
>
> Situational Type: Fear is cued by a situation such as public transportation, tunnels, bridges, elevators, flying, driving, or enclosed spaces.
>
> Other Type: Fear is cued by "other stimuli" such as situations that could lead to choking, vomiting, or contracting an illness.

Furthermore, the DSM-IV (1994) suggests that specific phobias of different types frequently co-occur: "In many cases, more than one subtype of specific phobia is present" (APA, 1994, p. 407). Specific phobias frequently co-occur with other anxiety disorders as well, particularly with panic disorder with agoraphobia, and in such cases, the other anxiety disorder is usually the emphasis of treatment. Social phobia, fear/avoidance/impairment that is cued by social or performance situations, is commonly included in research about specific phobias. However, agoraphobia is usually

categorized with panic disorders due to slightly different symptomology and treatment concerns.

No known studies have used the DSM-IV (1994) specific phobia types along with the criteria to estimate prevalence rates or factor structure of specific phobias. This study proposes to assess the fears and phobias of a sample of undergraduate university students in order to analyze the factor structure of specific phobia types, and in order to estimate the prevalence rates of the DSM-IV (1994) types of specific phobias.

Additionally, this study proposes to emphasize life impairment, the fifth DSM-IV (1994) criteria for specific phobia, in assessing a few cases of specific phobia. Life impairment has rarely been emphasized in factor analysis or assessment; therefore this study will endeavor to clarify the value of this fifth criterion.

Review of the Literature

According to the DSM-IV (1994), prevalence rates (percentage of the sample) vary from study to study depending on the threshold used to determine impairment or distress and what types of specific phobias were included in each survey. Robins et al. (1984) and Wittchen (1986) found prevalence rates for any phobia as high as 11% in the United States and 13% in Germany (respectively). More recently, Kessler et al. (1994) reported a lifetime prevalence of specific phobia of 6.7% in men and 15.7% in women in their survey of national comorbidity in the United States. The DSM-IV (1994) reports a 1-year prevalence rate of a

community sample of, with lifetime rates ranging from 10% to 11.3%.

Many studies have presented prevalence rates for various types of phobias. For example, Agras, Sylvester, and Oliveau (1969) found prevalence rates for the following specific phobias among those who had at least one specific phobia: illness/injury (42%), storms (18%), animals (11%), agoraphobia (8%), death (7%), crowds (5%), and heights (5%). However, per population of 1000, the prevalence of any specific phobias was only 74 (7.4%). Fredrikson, Annas, Fischer, and Wik (1996) presented a total point prevalence (prevalence of current experience of phobia) of 19.9% for any specific phobia (26.5% for females and 12.4 % for males). Overall, 21.2% women and 10.9% men met criteria for any single specific phobia. Reporting multiple phobias were 5.4% of the females and 1.5% of the males. Animal phobia had a prevalence of 12.1% in women and 3.3% in men. Point prevalence of situational phobia was 17.4 % in women and 8.5% in men. No gender difference was observed for mutilation phobia, which was present in 3.2% of the women and 2.7% of the men. Throughout the literature, prevalence estimates vary considerably. Much of this variance is because there is no universally accepted criteria for diagnosis. Using the five criteria set forth in the DSM-IV (1994) as universally accepted diagnostic criteria may contribute toward this end.

Clinicians and researchers alike generally agree that specific phobias are quite a heterogeneous group. However, the

empirical support for classifying various specific phobia types is wanting. Only a few studies have examined the structure of specific phobia types (Fredrikson, Annas, Fischer, & Wik, 1996; Muris, Schmidt, & Merckelbach, 1997; Wilson & Priest, 1968).

The DSM-IV (1994) classification of specific phobia types was based on research that indicated differences among specific phobias with regard to age of onset, mode of acquisition, physiological response, and focus of apprehension (disgust or fear), as well as other factors (Antony, Brown, & Barlow, 1997). Barlow (1988) also suggests that the age of onset and the mode of acquisition are two important factors in understanding the differences between specific phobia types.

Age of Onset

Marks and Gelder (1966) studied the age of onset of the specific phobias for 139 adult patients who sought treatment. These were subdivided into four groups with phobias of animals and insects, specific situations (heights, thunder), social situations, and agoraphobia. Onset age of phobias differed between groups in that almost all animal and insect phobias started before age 5, while most other phobia types began after age 10. Oest's (1987) study is one of the most informative illustrations of the characteristics of specific phobias regarding age of onset. Most of his large sample was composed of individuals whose specific phobias were oppressive enough to drive them to seek treatment over an eight-year period. The types of phobias represented within the sample included animal

phobia, blood phobia, dental phobia, and claustrophobia. These were compared to social phobia and agoraphobia with regards to age of onset. Simple phobics had a much earlier mean age of onset than social phobics or agoraphobics. The age of onset was the earliest in animal phobics (mean = 7 years of age), blood phobics (mean = 9 years of age) and dental phobics (mean = 12 years of age). The mean age of onset for claustrophobia (20 years of age) was much closer to that of agoraphobia (mean = 26 years of age) and social phobia (approximate mean = 24).

Mode of Acquisition

According to Barlow (1988), modes of acquisition of specific phobias are fairly heterogeneous, including both false and true alarms of danger (or conditioning experiences), as well as vicarious or instructional factors. Oest and Hugdahl (1981) studied the ways phobic patients (small animal phobics, social phobics, and claustrophobics) acquired their phobias. They found that most (58%) of the patients attributed their phobias to conditioning experiences, while 17% recalled vicarious experiences, 10% instructions/ information, and 15% could not recall any specific onset circumstances. Oest (as cited in Barlow, 1988), used a structured questionnaire to determine modes of acquisition across six groups of phobics: animal phobia, social phobia, claustrophobia, agoraphobia, blood phobia, and dental phobia. The largest percentage of conditioning experiences occurred within agoraphobia (81%) and then among claustrophobics (69%) and dental phobics (68%). Fewer than 50%

of animal and blood/injury phobics reported conditioning experiences.

In a similar study with a sample of 22 spider phobic children, Merckelbach, Muris, and Schouten (1996) found that while 46% of the children claimed to have always been afraid, 41% ascribed the onset of their fear to aversive conditioning experiences (events that were additionally confirmed by parents). Those who believed that the parent had modeled the fearful response comprised an additional 18.1% of the sample.

Oest's (1992) study of blood and injection phobias assessed age of onset, age at treatment, marital and occupational status, history of fainting (physiological response) and impairment to determine subtypes and unique characteristics of specific phobia, blood-injection-injury type. In this study, Oest (1992) compared blood phobics with injection phobics across factors listed above. There were no differences on any of these factors between blood phobics and injection phobics, indicating or at least suggesting that the two specific phobias should be regarded as one diagnostic entity.

Besides studying factors as age of onset, mode of acquisition, physiological response, and focus of apprehension among the different types of specific phobia, some researchers have used factor analyses to determine the classification of fears and phobias.

Wilson and Priest (1968) were the first to examine the classification of "neurotic fears." They attempted to isolate

the underlying factors of unreasonable and exaggerated fears most frequently reported among an undergraduate population. Wilson and Priest asked 240 undergraduates to list any objects or events that caused them undue and unreasonable fear or anxiety. The 18 most frequently reported fear stimuli from that study were then presented to an independent group of 298 students (149 male and 149 female) with instructions that they be rated on a given scale of fear intensity. Using Hotelling's Principal Component technique with varimax rotation, Wilson and Priest retained a four-factor solution. The first factor, labeled "general insecurity," included fears of darkness, enclosed spaces, heights, being alone, noises at night, and crowds. This first factor accounted for 30.73% of the variance. The second factor was concerned with "wild animals that could be a real as well as a neurotic threat", such as snakes, sharks, bees and wasps, and rats and mice. Factor II explained 24.56% of the variance in the data. Factor III involved "harmless nocturnal insects", such as moths, spiders, and noises at night, and explained 26.10% of the variance. The fourth factor involved "domestic animals that are normally regarded as harmless", such as dogs and birds. This fourth factor accounted for 18.61% of the variance.

Rosenhan & Seligman (1989) proposed a 3-factor solution that includes animal, situational, and mutilation types of specific phobia. Fredrikson et al. (1996) studied whether the three-factor structure, as suggested by Rosenhan and Seligman (1989), could obtain empirical support. They analyzed data

collected from 704 randomly selected individuals using questionnaires that included fear of snakes, spiders, lightning, enclosed spaces, darkness, flying, heights, injections, dentists and injuries. The following true-false questions were said to be based on DSM-IV (1994) criteria and were used to define a phobia: (1) I give up things because of my fear; (2) My fear is greater than justified; and (3) I cannot control my fear. If participants responded affirmatively to all three questions, a phobia was defined for each object or situation. Participants were then classified as having no, single, or multiple phobias. A factor analysis supported the classification of fears and phobias into three factors: (1) situational phobias (lightning, enclosed spaces, darkness, flying and heights); (2) animal phobias (spiders and snakes); and (3) mutilation phobias (injections, dentists, injuries).

Muris et al. (1999) replicated the Fredrikson et al. (1996) study with children. They supplemented the Fredrikson et al. list of fears by including the fear of doctor visits, darkness, thunder, small/enclosed places, heights, viewing an operation, being in a hospital, visiting the dentist, getting a serious diseases, seeing blood, and flying in an airplane in accordance with common childhood fears. They factor-analyzed the data and confirmed identical factors as the Fredrikson et al. study: animal phobias, blood-injection-injury phobias, and natural-environment-situational phobias. Muris et al. (1999) also statistically analyzed goodness-of-fit indexes to compare this

three-factor model with (1) a single factor model; (2) a three correlated factor model; (3) a model with three factors and one higher order factor. These confirmatory factor analyses revealed that the 3-correlated-factors model and the 3-factors-loading-on-1-higher-order-factor model produced good fits of the data for all ages and genders.

Gulas, McClanahan, and Poetter (1975) studied the Fear Survey Schedule to locate latent variables (factors) within the instrument across a sample of 305 college students. Interestingly, they extracted six factors (explaining 41.78% of the variance) that were roughly compatible with those "intuitively categorized by Wolpe and Lang" in their edition of the survey. Their six factor solution (along with amount of variance explained) included (1) Hostile-Dependence (11.12%); (2) Body Assault (7.45%); (3) Developmental Fears (6.5%); (4) Performance and Evaluation (5.7%); (5) Death Evasion (5.63%); and (6) Nuisance Animals (5.3%). The first factor, *Hostile-Dependence*, included items concerning failure, feeling angry, and situations of social condemnation, loss, or error. Factor two, *Body Assault*, was comprised of items regarding sight of or experience of pain or medical procedures. Factor three, *Developmental Fear*, included a variety of items such as crossing streets, dogs, being with members of the opposite sex, and strange shapes. The fourth factor, *Performance and Evaluation*, was composed of items about public performance and public opinion. Factor five, *Death Evasion*, was comprised of an

assortment of items including thunder, looking down from high buildings, cemeteries, sight of deep water, and being in an elevator. The sixth factor, *Nuisance Animals*, included items about worms, flying insects, mice, spiders, bats, crawling insects, and harmless snakes.

While some studies (Fredrikson et al., 1996; Muris et al., 1999) have used DSM-IV (1994) criteria to determine existence of specific phobia among their participants, none have used the DSM-IV (1994) specific phobia types along with the criteria to estimate prevalence or factor structure. This study proposes to assess the fears and phobias of a sample of undergraduate university students in order to analyze the factor structure of specific phobia types, and in order to estimate the prevalence rates of the DSM-IV (1994) types of specific phobias.

Behavioral Assessment of Specific Phobias

Life impairment (when avoidance, fear, or anxious anticipation of encountering the phobic stimulus interferes significantly with a person's daily routine, occupational functioning, or social life, or if the person is markedly distressed about having the phobia) has rarely been emphasized in factor analysis or assessment; therefore this study also proposes to emphasize the fifth DSM-IV (1994) criteria for specific phobia, life impairment, in assessing a few cases of specific phobia. Researchers frequently measure the participant's approach to the feared stimulus to gauge the level of avoidance caused by the fear. This strategy involves the creation of a

fear hierarchy. Fear hierarchies comprise a list of graduated steps that require the participant to move closer and closer to the feared stimulus. Clearly, as steps taken toward the feared stimulus increase, avoidance decreases.

For example, in a multiple baseline across subjects design, Love, Matson, and West (1990) used reinforcement to reward efforts of autistic children with specific phobias in completing (at least some of) the steps toward the feared stimulus. Their dependent measures were (1) the number of approach steps completed, (2) the frequency of verbalizations or vocalizations of fear, and (3) the overall appearance of fear. Post-treatment assessments showed that the autistic children functioned effectively in previously fearful situations without verbalizations or appearance of fear.

Goldberg and Weisenberg (1992) also assessed the efficacy of their treatment by measuring approach toward the feared stimulus. The participant, who had a newspaper phobia, rated his level of anxiety on a scale from 0-10 during baseline, treatment, and post-treatment assessments to grade the level of anxiety experienced during each of the ranked tasks in the fear hierarchy. During baseline, the participant rated the highest ranked task (reading a newspaper while eating a sandwich) at an anxiety level of 10. During treatment, the participant rated this task as an 8, and during post-treatment assessment the participant reported feeling minimal anxiety, rating the task a 0.

Crowe, Marks, Agras, and Leitenberg (1972) used avoidance/approach measures as well as symptom-rating scales to gauge the progress of participants with specific phobia in treatment as compared to baseline data. Although differences between treatment types did not emerge on the symptom-rating scales, the avoidance/approach measures were sensitive to differences between treatment types.

Nelissen, Muris, and Merckelbach (1995) used what is called the behavioral avoidance test (BAT), as well as self-report of fear for baseline, treatment and post-treatment measures. The BAT is concerned with the DSM-IV (1994) diagnostic criterion D for specific phobia: avoidance. It uses the steps of the fear hierarchy to score the steps taken toward the feared stimuli as a negative measurement of avoidance. The BAT is similar to the other approach measures, however it uses a graded point system for approach steps.

While others have used approach and avoidance measures or subjective ratings to assess treatment outcomes, a relatively neglected area is the assessment of routine functioning in the presence of the feared stimulus. However, Jones and Friman (1999) indicated an area for future growth in the measurement of exposure effects by using a performance measure to evaluate the treatment of insect phobia.

Jones and Friman (1999) directly assessed life impairment in a youth with animal phobia. In this single-case study, Jones and Friman used the reason for referral, impairment in academic

performance due to the phobic stimuli, as the dependent measure. In the assessment phase, the 14-year old boy was given math probes in the presence of bugs ("bugs"), in the absence of bugs ("no bugs"), and in the absence of bugs with an additional statement that "there are bugs somewhere in this room" ("say bugs"). Assessment data showed higher rates of responding (correct math problems) during the "no bugs" condition than the other conditions. Responding was initially low in the "say bugs" condition, but gradually increased, whereas the "bugs" condition elicited consistently low responding.

During the treatment phase, performance measures showed no improvement when the participant completed the standard exposure procedures. When reinforcement (earning points toward desired toys) was added to the exposure treatment responding (math scores) dramatically increased. These results demonstrate that targeting an adaptive behavior that is directly affected by the phobic stimuli is valuable in addition to measuring approach or using other indirect measures of fear and anxiety.

From a practical standpoint, the use of approach measures in assessing and treating specific phobias neglects the ultimate goal of treatment: to restore normal life functioning. Unfortunately, the manner in which the phobia disrupts important life functioning in many cases of specific phobia has rarely been the focus of assessment or treatment. As Jones and Friman (1999) pointed out, researchers must consider the DSM-IV (1994) criterion for impairment (criterion E) that states that the

avoidance, anxiety, or distress "interferes significantly with the person's normal routine, occupational (or academic) functioning, or social activities or relationships" despite the diagnostic loophole that "the person may be markedly distressed about having the phobia" (DSM-IV, 1994, p. 410). Studies must directly measure impaired life functioning in order to provide a more complete and clinically relevant behavioral analysis by assessing and treating this essential criterion (Jones & Friman, 1999). Therefore, this study proposes to assess impairment of some single cases of specific phobias among university students on the basis of impairment.

Purpose of the Study

The purpose of this study is to empirically validate through factor analysis the DSM-IV (1994) factor structure of the five subtypes of specific phobias (animal type, natural-environment type, blood-injection-injury type, and situational type, excluding "other type") as well as social phobia to explore the most parsimonious factor structure. This analysis required the development an instrument that assesses specific phobia according to DSM-IV (1994) criteria. As a secondary purpose, this analysis will add to the literature a prevalence estimate among undergraduates. A third purpose is to explore the use of impairment measurement in assessing specific phobia, animal type through a few case studies. While most studies have treated and measured the anxiety and/or avoidance behaviors of specific phobias, they often neglect the assessment of specific functional

impairment that is caused by the anxiety and avoidance. This study may contribute to literature by adding support for direct assessment of functional impairment in the treatment of specific phobia by extending and replicating aspects of the Jones and Friman (1999) study.

Method

Participants

A sample of 288 (237 females = 83%, 45 males = 16%, 6 no gender specified = 1%) undergraduate students at a state university participated in the study by completing the *Object and Situation Anxiety Survey* (see Appendix A). Participant ages ranged from 15-47 with a mean of 18 years-of-age. Students, members of an introductory psychology course, were awarded class credit for attending survey sessions. After a brief description of the study, participants who signed an informed consent waiver were informed that they may discontinue their participation at any time and still receive credit (see Appendix B).

Measure

The *Object and Situation Anxiety Survey* (OSAS) assessed participants' fears. The OSAS was created for this study as a self-report scale derived from DSM-IV (1994) criteria and subtypes of specific phobia. It was comprised of five subsections that correspond to each DSM-IV (1994) criterion for specific phobia:

1. Anxiety or distress due to feared stimulus

2. Anxiety response which may be panic like (described as crying, freezing, feeling dizzy)
3. Acknowledgement that response to feared stimulus is excessive and unreasonable
4. Avoidance of feared stimulus whenever possible
5. Reaction to feared stimulus that interferes with routine, normal functioning or social activities

The OSAS assesses each of these criteria for the four DSM-IV (1994) subtypes of specific phobia (animal type, natural-environmental type, blood-injury type, and situational type), as well as social phobia (e.g., "Whenever possible, I *avoid* blood, injuries, or other medical procedures."). Item descriptions were nearly verbatim from DSM-IV (1994). Animal type was said to include animals or insects. Natural environment type was described as "natural objects, events or situations, such as storms, heights or water." The description of blood-injury type included "blood, injuries, injections or other medical procedures." Situational type was defined as "public transportation, tunnels, bridges, elevators, flying or enclosed places." Each OSAS item was rated on a Likert-type scale with the following descriptors: "rarely," "sometimes," "often," or "always."

The DSM-IV (1994) diagnostic criteria are vague regarding how many of the criteria need to be met and how severe symptoms must be to warrant a diagnosis of specific phobia. Therefore we chose to interpret our scores conservatively, in that the second

part of DSM-IV (1994) criterion E was excluded. However a less conservative estimate concerns the alteration of criterion B, which says that the feared stimulus "almost invariably" provokes a panic-like response. Therefore, those individuals who reported all five criteria as occurring at least "sometimes" for a particular phobic stimulus class were identified as "at risk" for a specific phobia. In other words, a specific criterion is satisfied if the participant circled "sometimes," "often," or "always." If all five criteria were satisfied for a subtype, the participant met the DSM-IV (1994) criteria for specific phobia.

Other information available on the OSAS included the age of the individual, an indication of the individual's current or past involvement in treatment for the fear, as well as a list of the four most anxiety provoking objects or situations.

Results

Prevalence

The prevalence rates of specific phobia types and social phobia are listed in Table 1. Included in these percentages are those who responded at least "sometimes" on all five items (criteria) for a phobia type. Consistent with previous work (Fredrikson et al. 1996), OSAS responses indicated that 18.8% of the participants were at risk for a specific phobia.

Factor Analysis

The suitability of the correlation matrix for factor analysis was assessed in several ways. Results of the Kaiser-Meyer-Olkin measure of sampling adequacy were promising (KMO =

.784). Additionally, Barlett's test of sphericity indicated that the use of the factor model was appropriate (approx. chi-square = 3231.563, $p < .0001$). The scree plots suggested seven factors, and the rotated seven-factor solution on 25 items from the OSAS explained a total of 70.338% of the variance in the data. Table 2 displays the varimax-rotated matrix of items which loaded .30 or greater on a specific factor (Cattell, 1973).

Interestingly, the first five factors corresponded precisely with the DSM-IV (1994) subtypes of specific phobia (situational, blood-injection-injury, natural environment, and animal type), as well as social phobia. The sixth factor included items regarding life impairment due to the feared stimulus in each subtype of phobia. We chose to discard this factor because it shared items with the other factors and because it was not interpretable in accordance with the other five factors. We also eliminated factor seven because the three items that loaded on this factor did not logically relate to one another. Thus, the final five-factor solution accounted for 59.182% of the total variance. Each OSAS factor was found to have adequate internal consistency, with coefficient alphas ranging from .76 (Animal) to .84 (Situational). Table 3 displays the actual items grouped by the five identified factors.

The first factor was comprised of all five items regarding situations such as public transportation, tunnels, bridges, elevators, flying, or enclosed places, as read in the DSM-IV (1994) under specific phobia, situational type. This factor

accounted for 13.09% of the variance in the data. The second factor included all five items concerning specific phobia, blood-injection-injury type, explaining 12.73% of the variance. The third factor consisted of the five items about social phobia; and it explained 11.58% of the variance. We labeled the fourth factor natural-environment type as it included the five items about fear of natural events such as storms, heights or water, as described in the DSM-IV (1994); factor four explained 10.99% of the variance. The fifth factor, labeled animal type, accounted for 10.79% of the variance in the data, as it was comprised of the five items regarding fears of animal and insects. Note that Q21, the item regarding life impairment among those with specific phobia, animal type, had a much lower loading (.312) than the other items on any of the five factors.

Behavioral Assessment Case Studies

Four individuals who responded to the survey indicated an interest in further phobia assessment. For each participant, we attempted to assess the impact of the phobia stimulus on life impairment in an analogue setting. Each assessment is described below. Because our primary interest was in measuring impairment, participants' fears had to interfere with a response that could be simulated in an analogue situation. Assessment procedures were conducted in a workroom at Eastern Illinois University. A separate consent form was required for those students who participated in the behavioral assessment (see Appendix B), and

ethical approval for the following procedures was obtained from the departmental ethics committee.

The response measurement was based on the specific area of impairment that the participant suffered. Therefore, the response measurement was individualized. Response measurement obtained a rate-based estimate of impairment (for example, digits of math problems completed correctly). During 29 (31%) sessions of all conditions, a secondary observer independently coded responses. Interobserver agreement ranged from 60% to 100% (mean = 89%). Interobserver agreement was calculated by dividing the lower estimate by the higher estimate and multiplying by 100 (Miller, 1997).

During the assessment, we alternated two conditions that contrasted the presence and absence of the feared stimulus. This served to assess the degree of impairment and provide a baseline if we were to evaluate the effects of treatment. We used a multi-element design during assessment, presenting the two conditions (feared stimulus/no feared stimulus) in an arbitrary sequence until clear differences emerged.

Lisa

Lisa was a nineteen-year-old married female who reported an extreme fear of spiders on the OSAS as well as in an interview. She defined her life impairment by her difficulty concentrating when a spider is nearby and by her desire to leave the room immediately when a spider is present. We used a dependent measurement that consisted of 30 alternate form math probes at

the 5th grade level (see Appendix C), counting digits correct to measure life functioning and impairment. We alternated experimental conditions between a room with a live tarantula and a room with no spiders. In both conditions, Lisa attempted to complete as many math problems as possible in four minutes. There was also a buffer period between conditions. Lisa's response to these conditions did not indicate any significant life impairment in this area (see Figure 1). Her mean score across the baseline conditions (42 digits correct) was only marginally higher than her mean score across the spider conditions (37 digits correct). Anecdotally, we compared these results to a Behavioral Avoidance Test (BAT) in which Lisa was required to gradually approach the tarantula, progressing from one fear hierarchy step to the next once she felt minimal anxiety. In the final step of the hierarchy, Lisa was asked, "do you think you could touch the spider now." Although Lisa was not permitted to touch the tarantula, her positive response and her movement toward the spider on this final step indicated that Lisa was able to progress through all ten steps on the BAT without any hesitation.

Dave

Dave, a 24-year-old white male, reported a severe fear of spiders due to a traumatic experience as a child. He responded "always" on all OSAS items regarding fear of animals/insects. During the interview, Dave indicated that his fear and anxiety are frustrating to those around him, as he consistently demands

that others remove spiders from his presence (as he is "frozen" with anxiety). He also related his hesitation to spend much time outdoors with friends because he might encounter a spider. As with Lisa, experimental conditions with Dave involved alternating between the "spider" condition and the "no spider" condition as previously described, with the four-minute math probe serving as the dependent variable. Dave also utilized a fifteen-minute "buffer time" between conditions. The results of Dave's assessment, as shown in Figure 1, evidenced some degree of impairment as a difference was seen in his performance between conditions. Dave's mean score in the "no spider" condition was 63 digits correct, remarkably higher than his mean score in the "spider" condition (42 digits correct). We successfully identified an area of impaired functioning for Dave.

Tina

Tina was a 28-year-old white female who reported a fear of dogs, particularly large black dogs. Like Dave, her fear was the result of a traumatic dog attack. Tina related that she was unable to enjoy walking in public places where dogs might be present and that she was unable to attend social events where dogs would be present. We located a large, black, tame dog to use during experimental conditions and used a cat in control conditions. As a dependent variable, we counted "contact," including strokes along the length of the animal's body as well as food bits fed to the animal during a five-minute period. Tina's mean rate of strokes and feedings during the cat

conditions was 64. Interestingly, during the initial dog condition, Tina was unable to feed the dog (see Figure 2). In subsequent conditions, Tina gradually increased contact with the dog, increasing to a mean of 64 contacts during the last two probes - similar to the cat conditions. These data suggest that Tina's impairment was sensitive to minimally invasive exposure.

Tara

Tara, a 31-year-old Guatemalan female, reported a severe fear of worms (all types) that prohibited her from leaving her home after it rained (due to the sidewalks being full of worms) and from working in the garden with her mother. Tara was concerned about her fearful behavior and her avoidance because it inconvenienced her husband (he would have to clear the sidewalk before she would leave) and because she did not want to teach her son to be afraid of harmless worms. On the OSAS, Tara responded "always" to all questions pertaining to animals/insects.

To assess her fear, we began with the 4-minute math probe for a dependent variable, as used with Lisa and Dave. For the "worms" conditions, we placed approximately 5 worms on the table where Tara was asked to perform the math problems. In the "no worms" conditions, Tara performed math problems on a table in a room without worms in it. Figure 2 shows no significant difference between her mean scores during the "worms" conditions (42 digits correct) and the "no worms" conditions (49 digits correct). Tara reported that she was able to focus her attention on the math problems in order to avoid the worms "mentally." We

then attempted to draw her attention to the worms during the "worms" conditions by placing them directly on the math sheet for the "worms" conditions and requiring her to use a separate answer sheet in both "worms" and "no worms" conditions. This did not significantly alter her scores except by decreasing her overall score for the time to write out the equations on her answer sheet ("worms" mean = 28; "no worms" mean = 20).

At this point we opted to try a different analogue setting that was more similar to the life impairment she reported: walking on a sidewalk with worms present. In this setting, Tara was required to walk a set distance on sidewalk. In the "worms" conditions, the sidewalk was littered with worms enough that Tara would have to look where she was stepping, lest she step on a worm. In the "no worms" conditions, the sidewalk was clear of worm bodies. As a dependent variable, we measured the time it took Tara to walk from the beginning to the end of the pre-measured sidewalk. Again, Tara was able to walk a length of sidewalk in the same amount of time with or without worms present (see Figure 2). She attributed this to the public setting of the test (that she would not allow herself to show her anxiety in public).

Finally, we set up an analogue garden, two large containers filled with potting soil - one with worms for the "worms" conditions, and one without worms for the "no worms" conditions. We asked Tara to use a spoon to plant as many onion bulbs as possible in four minutes for the dependent variable. Using the

spoon, Tara planted 19 bulbs in both the "worms" condition and in the "no worms" condition. Therefore, we repeated these conditions but required her to plant bulbs in the soil using only her hands. This was the only behavioral test for life impairment that Tara showed any difference between conditions; however, the difference between the final conditions was substantial. In the "worm" condition Tara planted 29 bulbs in four minutes, but planted 0 bulbs in the "no worms" condition, as shown in Figure 2.

Discussion

OSAS responses indicated that 18.8% of the participants were at risk for a specific phobia. Specific phobia, animal type was present in 2.1% of this undergraduate sample, natural-environment type was present in 3.5%, blood-injury-injection type was in 6.6% of the sample, and situational type was present in 2.4% of the sample. Social phobia was present in 8.7% of the participants.

Ratings were factor analyzed and the principal components procedure extracted five factors with eigenvalues above unity, which accounted for approximately 60% of the total variance. The rotated five-factor solution corresponded precisely with the DSM-IV (1994) subtypes, plus social phobia. Each OSAS factor was found to have adequate internal consistency, with coefficient alphas ranging from .76 (Animal) to .84 (Situational).

This study contributed to the assessment of specific phobia in four important ways. First, no known studies have used DSM-IV

(1994) criteria and subtypes together to determine the presence of a specific phobia. Fredrikson et al. (1996) used three questions to define a phobia based on DSM-IV (1994) criteria: (1) I give up things because of my fear; (2) My fear is greater than justified; and (3) I cannot control my fear. However, these three criteria appear to be a liberal interpretation of the five DSM-IV (1994) criteria thus rendering limited information for defining a phobia.

Second, our factor analysis confirms the DSM-IV (1994) specific phobia subtypes. While many studies have suggested types of specific phobias and symptom clusters among various types of fears, this study is the first to empirically support the five specific phobia subtypes listed in the DSM-IV (1994).

Third, consistent with previous work (Fredrikson et al. 1996), OSAS responses indicated that 18.8% of the participants could be defined as having specific phobia. Interestingly, these figures have also been generated in studies regarding women with fears and phobias, such as Costello (1982) who found a prevalence rate of 19%, and Bourden et al. (1988) who reported a prevalence rate of 17%.

Finally, our evaluation of four cases of specific phobia revealed that assessment could potentially target life impairment as a critical issue for baseline and treatment measures. It is possible that focusing assessment measures on the life impairment experienced by individuals with specific phobias could indicate more precisely when treatment has been effective than approach

measures would indicate. For example, if only approach and subjective measures are used, only the decrease of avoidance and the subjective experience of fear will determine termination of effective treatment. However, these improvements may not be significant enough to merit closure of treatment if the individual's "routine, occupational (or academic) functioning or social activities or relationships" have not also improved with regards to the fear (DSM-IV, 1994, p. 410). Therefore, some measure of life function may be additionally necessary in the assessment and treatment of specific phobia.

Limitations

Some limitations with the generality of the present study should be noted. All participants were undergraduate first and second year students at a public university. Additionally, most of the participants were female (82%) and over 77% of the sample were 18 or 19 years of age. Therefore our prevalence rates and factor structure may only concern a limited population in the case that prevalence rates and factor structure among other populations are different.

Furthermore, DSM-IV (1994) criteria and subtypes restricted the item pool used on the OSAS. It could be that a greater variance of items would refine certain factors. For example, items could have described different types of avoidance behaviors and escape or approach behaviors to more accurately define the diagnostic criteria.

As well, the range of phobic stimuli was restricted to the subtype descriptions used in the DSM-IV (1994). Other studies have included a greater variety of phobic stimuli such as dental phobia or agoraphobia. Some studies have disregarded the categories of fears (subtypes) by listing only specific stimuli. For instance, many have debated whether fear of heights and fear of flying should be categorized with fears of injury, or fears of enclosed places, or even the fear of having a panic attack in public (Van Gerwen, Spinhoven, Diekstra, & Van Dyck, 1997). Perhaps examining the rationale or expectation behind the phobia might generate more precise factors.

Another obvious limitation of this study is its reliance on self-report. While self-report measures tend to lack accuracy, they also lack specificity. For example, Tara self-reported avoidance and life impairment caused by her fear of worms. However, her fear (and life impairment) was only manifested in highly circumscribed conditions. Therefore, we cannot be certain about how self-reported ratings correspond to actual responses in everyday life.

Moreover, the scale has not been validated for clinical use. There were too few participants with clinically relevant fears in this study to compare a clinical population with a non-clinical sample. Therefore we cannot be confident of the ability of the OSAS to distinguish clinical samples from normal samples. This could be accomplished by validating the instrument on a clinical sample of specific phobias of different types, plus

social phobia and other anxiety disorders. This could allow us to gain confidence in the ability of the OSAS to differentiate between clinical and non-clinical samples.

Future Directions

This study points toward further investigations in several areas. Clearly, the OSAS needs to be validated using clinical and normal populations, as well as with children and adolescents. It may also be interesting to compare the OSAS with other anxiety scales to assess criterion-related validity.

Moreover, DSM-IV (1994) subtypes are based on the topography of the stimulus, for example, animals and blood. However, other models for classifying fears have also been proposed such as categorizing fears by age of onset, mode of acquisition, physiological response, focus of apprehension (Antony, Brown, & Barlow, 1997), and other principal components analyses for subtype structure, as well as response to treatment. While this study attempted to discover how the DSM-IV subtypes held together, future work in this area may reveal which classification schemes provide the most clinical utility.

Second, direct assessment of impairment is a challenge to practitioners. Practically speaking, the maintenance of animals and insects (in the case of animal type phobias) requires a suitable environment as well as the time necessary to adequately care for the animals' health. Without institutional provisions and support, such an undertaking of housing and feeding animals and insects is at best, strenuous. Animals and insects are also

unpredictable and uncontrollable, which can lead to various and sundry methodological setbacks. For example, Dave, the spider-phobic, reported being more afraid of the tarantula when it moved unexpectedly. A simple change in climate, causing the spider to move more, or less, could (and did) alter his experience of fear (and thus, the data) on any occasion. Another methodological concern about the direct assessment of impairment is the equivocal resemblance of the analogue situation and the actual life setting. For example, even though Tara was able to walk down a sidewalk laden with worms as quickly as she walked down a sidewalk without worms, she still may not be able to leave her home after a rain, due to her anxiety about the worms covering the sidewalk. The clarity of the relationship between the analogue situation and the actual life setting is unknown.

Life impairment is typically minimized in the assessment and treatment of specific phobias; thus, it is unclear how critical this criterion may be. However, life impairment did emerge as a distinct factor in our principal components extraction, suggesting perhaps that the factor of life impairment separates phobics from non-phobics. Additionally, the loading for life impairment for animal phobias was substantially lower than all other loadings (see Table 3). This may indicate that for animal phobias, but not others, it is more difficult to establish impairment. This certainly was our experience while assessing Tara's worm phobia.

In the midst of studying the value of life impairment criteria in the assessment of phobias, we found contradictory terms in the DSM-IV (1994) that led to possible research questions regarding the inconsistency among DSM criterion E. This DSM-IV (1994) criterion reads that

> The diagnosis [of specific phobia] is appropriate only if the avoidance, fear, or anxious anticipation of encountering the phobic stimulus interferes significantly with the person's daily routine, occupational functioning, or social life, or if the person is markedly distressed about having the phobias (DSM-IV, 1994, p. 405).

The contradiction is that life impairment is not truly necessary for the diagnosis of specific phobia, due to the diagnostic loophole of an individual's distress about having the fear. However, in explaining the common experience of fears, the DSM-IV (1994) notes that many cases of fears are common, but do not warrant a diagnosis due to an insufficient degree of impairment (p. 406). The question remains: How important is life impairment in the diagnosis, assessment, and treatment of specific phobia?

Finally, the current study indicates the need for further studies to link the area of assessing life impairment in phobias to treatment evaluation, as seen in the Jones and Friman (1999) study. Certainly the cases used in this study point to the use of life impairment measures in the evaluation of treatment. Given the paucity of research using impairment measures in the assessment and treatment of phobia, it may behoove researchers

and clinicians to more closely observe and examine the criterion of impairment among specific phobics.

References

Agras, S., Sylvester, D., & Oliveau, D. (1969). The Epidemiology of common fears and phobia. Comprehensive psychiatry, 10, 151-156.

American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., Rev. ed.). Washington, DC: Author.

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.

Antony, M. M., Brown, T. A., & Barlow, D. H. (1997). Heterogeneity among specific phobia types in DSM-IV. Behaviour Research and Therapy, 35, 1089-1100.

Barlow, D. H. (1988). Anxiety and its disorders. New York: Guilford Press.

Bourden, K. H., Boyd, J. H., Rae, D. S., Burns, B. J., Thompson, J. W., & Locke, B. Z. (1988). Gender differences in phobias: Results of the ECA communicty survey. Journal of Anxiety Disorders, 2, 227-241.

Cattell, R. B. (1973). Factor analysis: An introduction and manual for the psychologist and social scientist. Westport, Connecticut: Greenwood Press.

Costello, C. G. (1982). Fears and phobias in women: A Community study. Journal of Abnormal Psychology, 91, 280-286.

Crowe, M. J., Marks, I. M., Agras, W. S., & Leitenberg, H. (1972). Time-limited desensitisation, implosion and shaping for phobic patients: A crossover study. Behaviour Research and Therapy, 10, 319-328.

Fredrikson, M., Annas, P., Fischer, H., & Wik, G. (1996). Gender and ages differences in the prevalence of specific fears and phobias. Behaviour Research and Therapy, 34: 33-39.

Goldberg, J., & Weisenberg, M. (1992). The case of a newspaper phobia in a 9-year old child. Journal of Behavior Therapy and Experimental Psychiatry, 23, 125-131.

Gulas, I., McClanahan, L. D., & Poetter, R. (1975). Phobic response factors from the Fear Survey Schedule. Journal of Psychology, 90: 19-25.

Jones, K. M., & Friman, P. C. (1999). A Case study of behavioral assessment and treatment of insect phobia. Journal of Applied Behavior Analysis, 32, 95-98.

Kessler, R. C., McGonagle, K. A., Zhao, S. Z., Nelson, C. B., Hughes, M., Eshleman, S., Wittchen, H. U., & Kendler, K. S. 1994). Lifetime and 12-month prevalence of DSM-III-R Psychiatric Disorders in the United States. Archives of General Psychiatry, 51, 8-19.

Love, S. R., Matson, J. L., & West, D. (1990). Mothers as effective therapists for autistic children's phobias. Journal of Applied Behavior Analysis, 23, 379-385.

Marks, I. M., & Gelder, M. G. (1966). Different ages of onset in varieties of phobia [Abstract]. American Journal of Psychiatry, 123, 218-221.

Merckelbach, H., Muris, P., & Schouten, E. (1996). Pathways to fear in spider phobic children. Behaviour Research and Therapy, 34, 935-938.

Miller, L. K. (1997). Principles of Everyday Behavior Analysis (3rd ed.). Pacific Grove, CA: Wadsworth, Inc.

Muris, P., Merckelbach, H., van Haaften, H., & Mayer, B. (1997). Eye movement desensitization and reprocessing versus exposure in vivo: A single-session crossover study of spider phobic children. British Journal of Psychiatry, 171, 82-86.

Muris, P., Schmidt, H., & Merckelbach, H. (1999). The structure of specific phobia symptoms among children and adolescents. Behaviour Research and Therapy, 37: 863-868.

Nelissen, I., Muris, P., & Merckelbach, H. (1995). Computerized exposure and in vivo exposure treatments of spider fear in children: Two case reports. Journal of Behavior Therapy and Experimental Psychiatry, 26, 153-156.

Oest, L. G. (1987). Age at onset in different phobias. Journal of Abnormal Psychology, 96, 223-229.

Oest, L. G. (1992). Blood and injection phobia: Background and cognitive, physiological, and behavioral variables. Journal of Abnormal Psychology, 101, 68-74.

Oest, L. G., & Hugdahl, K. (1981). Acquisition of phobias and anxiety response patterns in clinical patients. Behaviour Research and Therapy, 19, 439-447.

Robins, L. N., Helzer, J. E., Weissman, M. M., Orvaschel, H., Gruenberg, E., Burke, J. D., Jr., & Regier, D. A. (1984). Lifetime prevalence of specific psychiatric disorders in three sites. Archives of General Psychiatry, 41, 949-958.

Rosenhan, D. L., & Seligman, M. E. P. (1989). Abnormal psychology. New York: Norton.

Van Gerwen, L. J., Spinhoven, P., Diekstra, R. F. W., & Van Dyck, R. (1997). People who seek help for fear of flying: Typology of flying phobics. Behavior Therapy, 28, 237-251.

Wilson, G. D., & Priest, H. F. (1968). The Principal components of phobic stimuli. Journal of Clinical Psychology, 24, 191.

Wittchen, H-U. (1986). Epidemiology of panic attacks and panic disorders. In I. Hand & H-U. Wittchen (Eds.), Panic and Phobias. Berlin: Springer-Verlag.

Table 1. Prevalence Rates of Specific and Social Phobia among Undergraduate Sample

Phobia type	Prevalence
Animal	2.1%
Natural Environment	3.5%
Blood/Injury/Injection	6.6%
Situational	2.4%
Social	8.7%
One or More	18.8%

Note. Prevalence rates include responses of at least "sometimes" on all five items for a phobia type.

Table 2. Rotated Factor Matrix with VARIMAX Rotation of Items on the Object and Situation Anxiety Survey [a]

ITEMS	F1	F2	F3	F4	F5	F6	F7
Q1. Animal					.84		
Q2. Natural				.81			
Q3. Blood/Injury		.80					
Q4. Situational	.77						
Q5. Social			.67				
Q6. Animal					.60		.42
Q7. Natural				.69			.36
Q8. Blood/Injury		.84					
Q9. Situational	.83						
Q10. Social			.79				
Q11. Animal					.85		
Q12. Natural				.69			
Q13. Blood/Injury		.81					
Q14. Situational	.77						
Q15. Social			.83				
Q16. Animal					.79		
Q17. Natural				.79			
Q18. Blood/Injury		.70					.44
Q19. Situational	.83						
Q20. Social			.71				
Q21. Animal					.31	.79	
Q22. Natural				.58		.59	
Q23. Blood/Injury		.74				.44	
Q24. Situational	.67					.57	
Q25. Social			.68			.42	

Note. Extraction method: Principal Component Analysis. Rotation Method: Varimax with K-M-O Normalization. F = Factor. Q = Item.

[a] Factor loadings >. 30 displayed.

Table 3. Items Rotated Factor Loadings and Percentage Explained Variance for Factors of the OSAS[a]

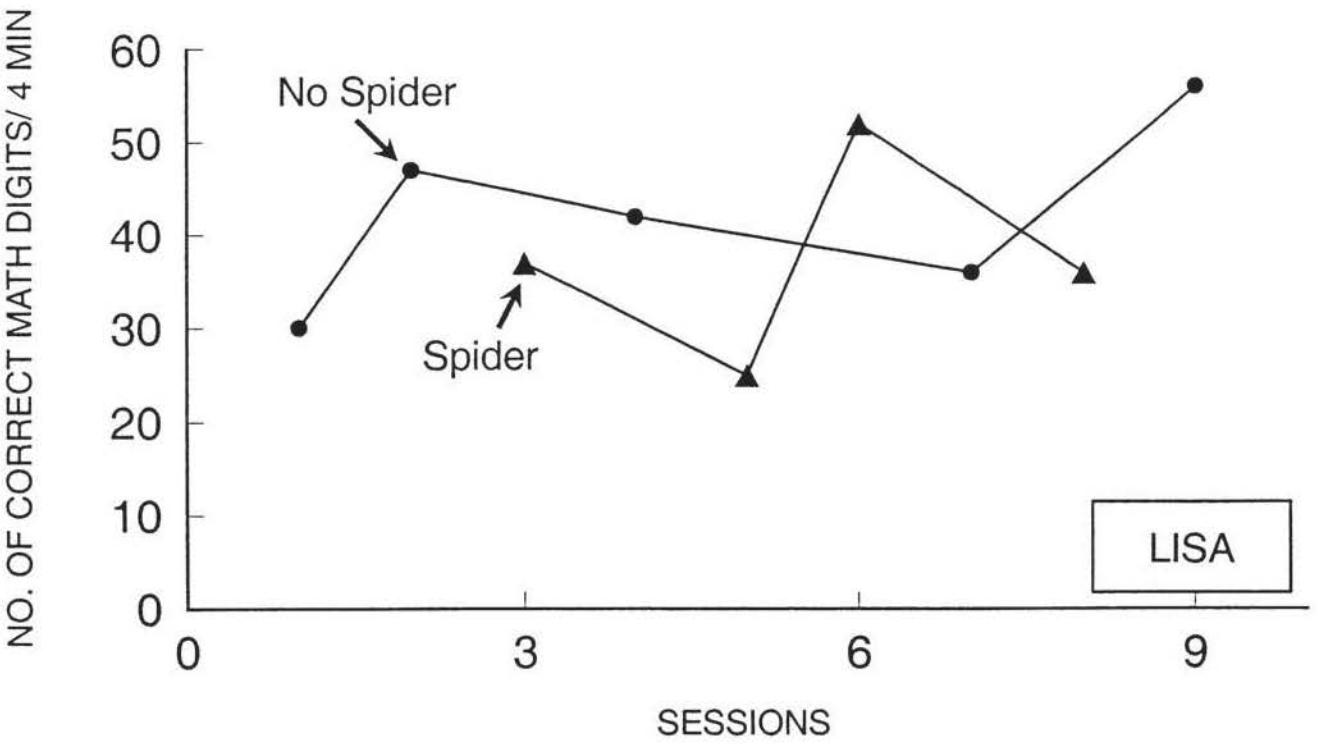
SAMPLE ITEM	LOADING
F1: Situational type (13.09%)	
Q4: Public transportation tunnels, bridges, elevators, flying, or enclosed places, cause me anxiety or distress.	.768
Q9: I have a panic attack (e.g., cry, freeze, feel dizzy) when I'm in situations such as transportation, tunnels, bridges, elevators, flying or enclosed places.	.829
Q14: My response to situations such as transportation, tunnels, bridges, elevators flying, or enclosed places is excessive and unreasonable.	.766
Q19: Whenever possible, I avoid situations such as transportation, tunnels, bridges, elevators, flying or enclosed places.	.832
Q24: My reaction to situations such as transportation, tunnels, bridges, elevators, flying or enclosed places interferes with my routine, normal functioning or social activities.	.670
F2: Blood-injection-injury type (12.73%)	
Q3: Blood, injuries, injections or other medical procedures cause me anxiety or distress.	.799
Q8: I have a panic attack when I'm around blood, injuries, injections or other medical procedures.	.842
Q13: My response to blood, injuries, injections or other medical procedures, is excessive and unreasonable.	.813
Q19: Whenever possible I avoid blood, injuries, injections or other medical procedures.	.697
Q23: My reaction to blood, injuries, injections or other medical procedures, interferes with my routine, normal functioning or social activities.	.734
F3: Social Phobia (11.58%)	
Q5: Social events, tests or performance measures cause me anxiety or distress.	.666
Q10: I have a panic attack before or during social events, tests, or performance measures.	.787
Q15: My response to social events, tests or performance measures, is excessive and unreasonable.	.830
Q20: Whenever possible, I avoid social events, tests, and performance measures.	.711
Q25: My reaction to social events, tests, or performance measures, interferes with my routine.	.683
F4: Natural Environment Type (10.99%)	
Q2: Certain natural objects, events, or situations, such as storms, heights or water cause me anxiety or distress.	.814
Q7: I have a panic attack when I'm around certain natural objects, events, or situations, such as storms, heights or water.	.694
Q12: My response to certain natural objects, events, or situations, such as storms, heights or water, is excessive and unreasonable.	.693
Q17: Whenever possible, I avoid certain natural objects, events, or situations, such as storms, heights or water.	.793
Q22: My reaction to certain natural objects, events, or situations, such as storms, heights or water interferes with my routine, normal functioning or social activities.	.577
F5: Animal Type (10.79%)	
Q1: Certain animals or insects cause me anxiety or distress.	.842
Q6: I have a panic attack when I'm around certain animals or insects.	.601
Q11: My response to certain animals or insects is excessive and unreasonable.	.851
Q16: Whenever possible, I avoid certain animals or insects.	.787
Q21: My reaction to certain animals or insects interferes with my routine, normal functioning or social activities.	.312

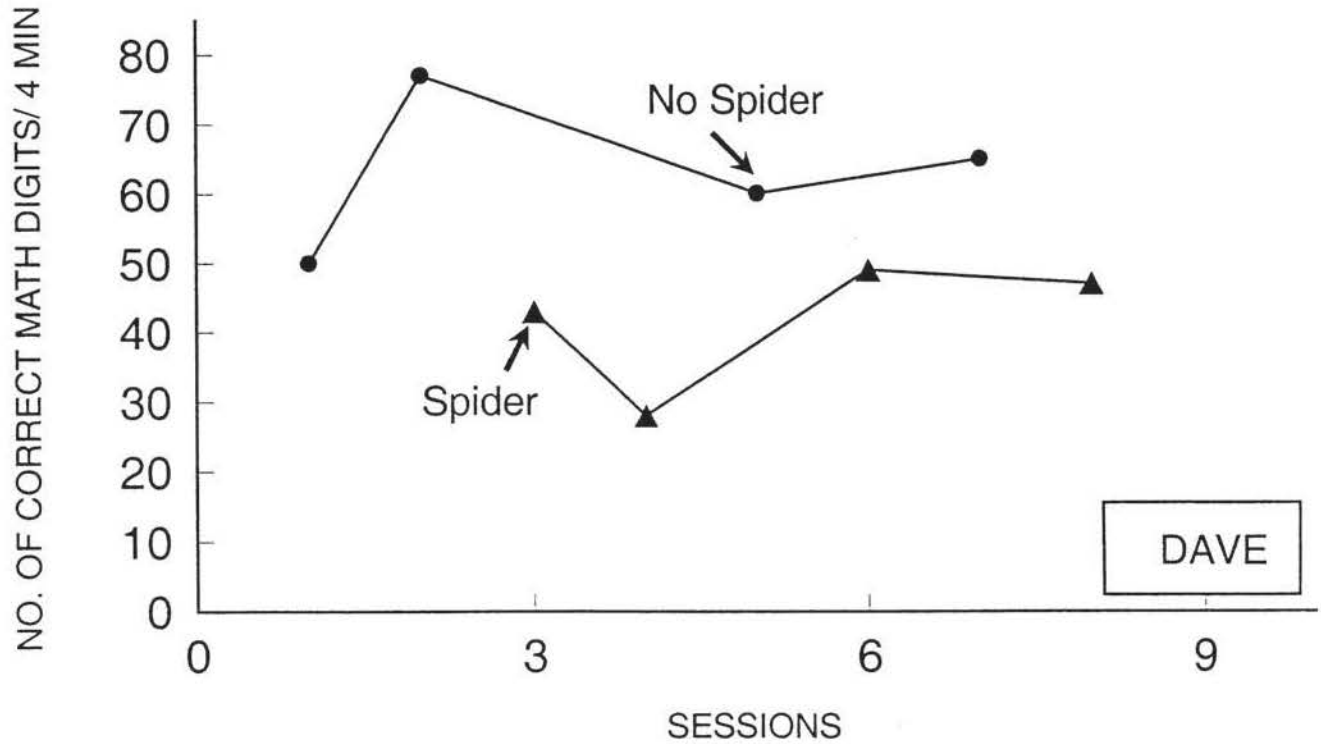
Note. Q = item number. [a] Only 5-factor solution shown.

Figure Captions

Figure 1. The top panel displays Lisa's math performance across the two experimental conditions. The bottom panel displays Dave's math performance across the two experimental conditions.

Figure 2. The top panel displays Tina's number of contacts (brushing or feeding) across the two experimental conditions. The bottom panel displays Tara's performance across the two experimental conditions for the five different experimental contexts.


NO. OF CORRECT MATH DIGITS/ 4 MIN
60
50
40
30
20
10
0
No Spider
Spider
LISA
0
3
6
9
SESSIONS


NO. OF CORRECT MATH DIGITS/ 4 MIN
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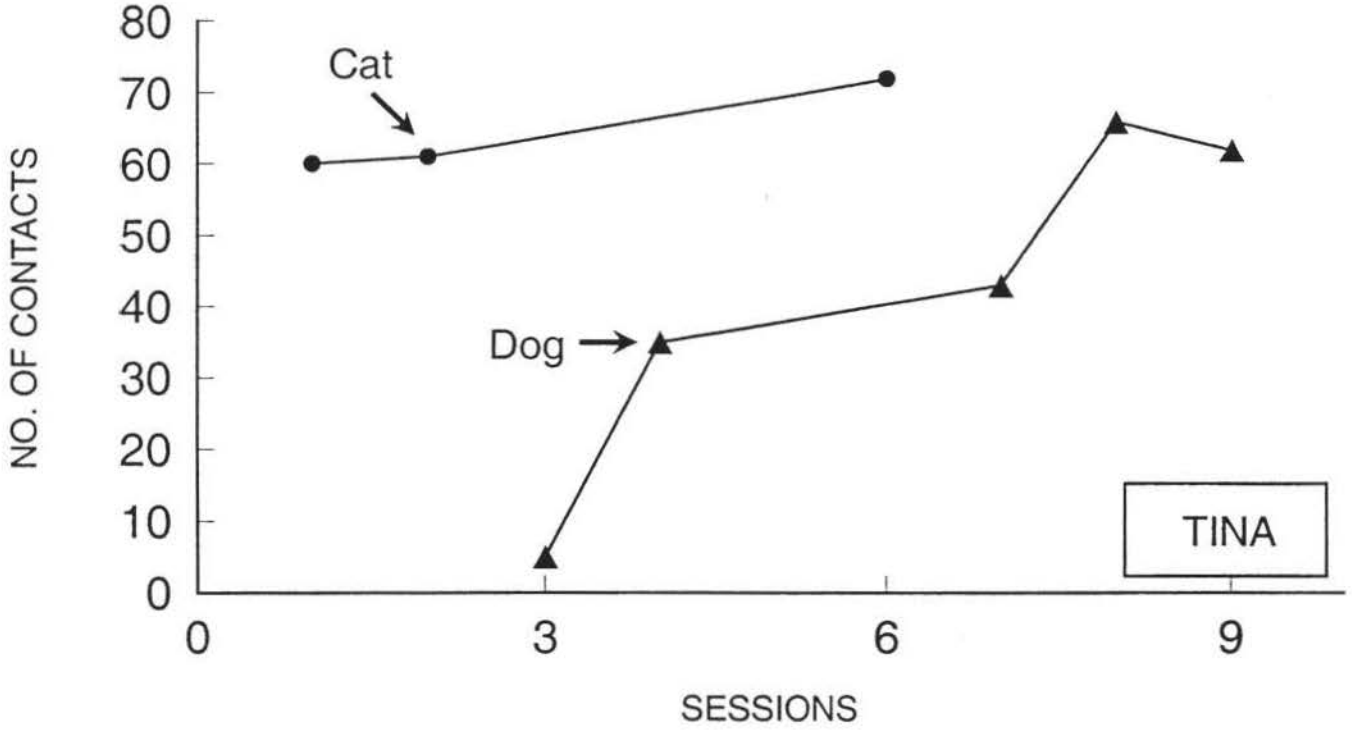
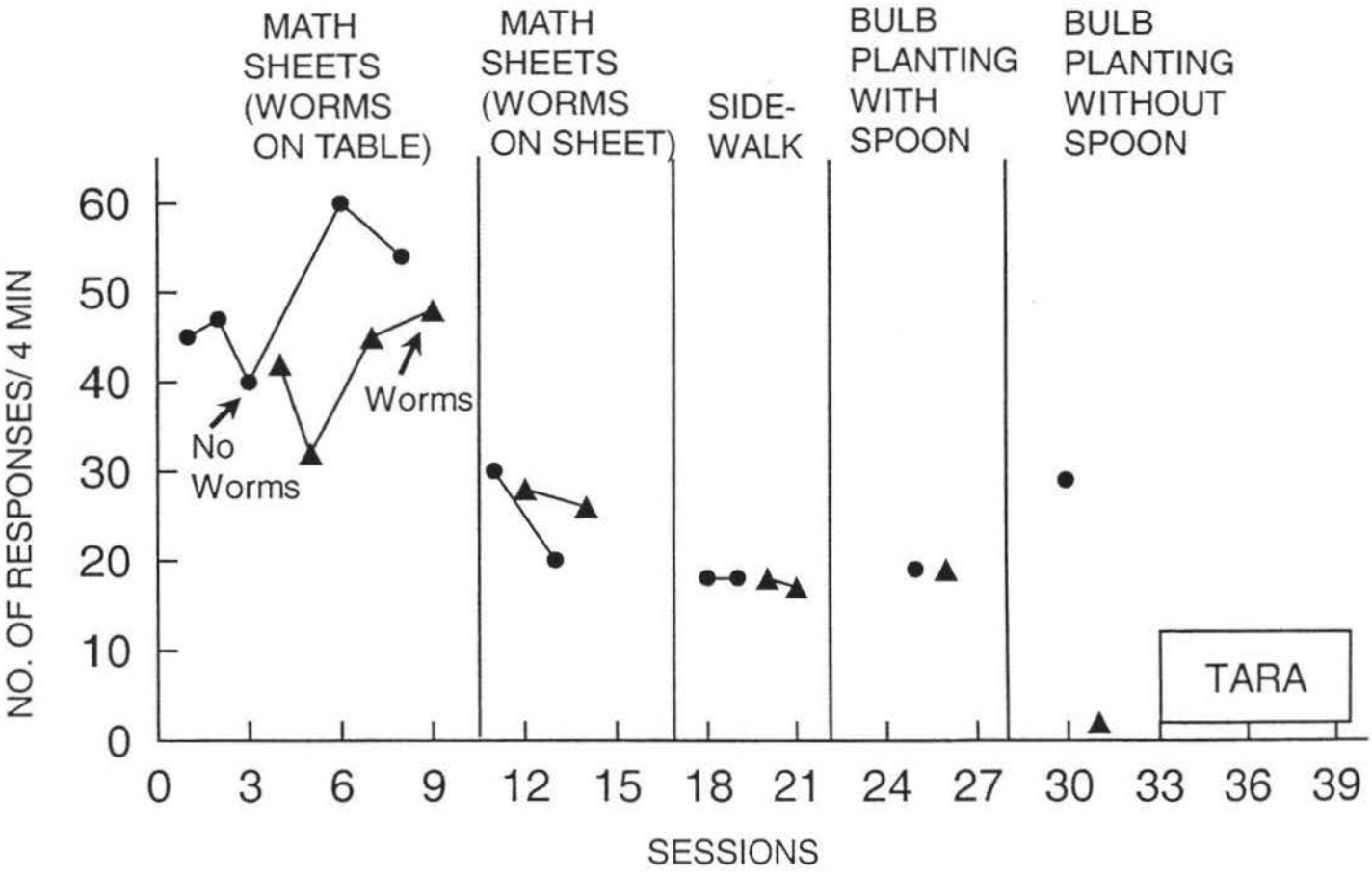
70
60
50
40
30
20
10
0
No Spider
Spider
DAVE
0
3
6
9
SESSIONS


80
70
60
50
40
30
20
10
0
NO. OF CONTACTS
Cat
Dog
TINA
0
3
6
9
SESSIONS


MATH SHEETS (WORMS ON TABLE)
MATH SHEETS (WORMS ON SHEET)
SIDE-WALK
BULB PLANTING WITH SPOON
BULB PLANTING WITHOUT SPOON
60
50
40
30
20
10
0
NO. OF RESPONSES/ 4 MIN
No Worms
Worms
TARA
0
3
6
9
12
15
18
21
24
27
30
33
36
39
SESSIONS

Appendix A

Object and Situation Anxiety Survey

Object and Situation Anxiety Survey

Age _____ Circle: Male Female

Check all that apply:

____ I have received treatment (therapy, medication) for anxiety/fears in the past.
____ I am currently receiving treatment (therapy, medication) for anxiety/fears.
____ I would consider receiving treatment (therapy, medication) for anxiety/fears.

Please read each of the following items carefully and circle the descriptor that best describes your own thoughts, feelings and actions.

1. Certain animals or insects cause me anxiety or distress.

Rarely *Sometimes* *Often* *Always*

2. Certain natural objects, events, or situations, such as storms, heights or water cause me anxiety or distress.

Rarely *Sometimes* *Often* *Always*

3. Blood, injuries, injections or other medical procedures cause me anxiety or distress.

Rarely *Sometimes* *Often* *Always*

4. Public transportation, tunnels, bridges, elevators, flying, or enclosed places, cause me anxiety or distress.

Rarely *Sometimes* *Often* *Always*

5. Social events, tests or performance measures cause me anxiety or distress.

Rarely *Sometimes* *Often* *Always*

6. I have a panic attack (e.g, cry, freeze, feel dizzy) when I'm around certain animals or insects.

Rarely *Sometimes* *Often* *Always*

7. I have a panic attack (e.g, cry, freeze, feel dizzy) when I'm around certain natural objects, events, or situations, such as storms, heights or water.

Rarely *Sometimes* *Often* *Always*

8. I have a panic attack (e.g, cry, freeze, feel dizzy) when I'm around blood, injuries, injections or other medical procedures.

Rarely *Sometimes* *Often* *Always*

9. I have a panic attack (e.g, cry, freeze, feel dizzy) when I'm in situations such as transportation, tunnels, bridges, elevators, flying, or enclosed places.

Rarely *Sometimes* *Often* *Always*

10. I have a panic attack (e.g, cry, freeze, feel dizzy) before or during social events, tests, or performance measures.

Rarely *Sometimes* *Often* *Always*

11. My response to certain animals or insects is excessive and unreasonable.

Rarely *Sometimes* *Often* *Always*

12. My response to certain natural objects, events, or situations, such as storms, heights or water, is excessive and unreasonable.

Rarely *Sometimes* *Often* *Always*

13. My response to blood, injuries, injections or other medical procedures, is excessive and unreasonable.

Rarely *Sometimes* *Often* *Always*

14. My response to situations such as transportation, tunnels, bridges, elevators, flying, or enclosed places, is excessive and unreasonable.

Rarely *Sometimes* *Often* *Always*

15. My response to social events, tests, or performance measures, is excessive and unreasonable.

Rarely *Sometimes* *Often* *Always*

16. Whenever possible, I avoid certain animals or insects.

Rarely *Sometimes* *Often* *Always*

17. Whenever possible, I avoid certain natural objects, events, or situations, such as storms, heights or water.

Rarely *Sometimes* *Often* *Always*

18. Whenever possible, I avoid blood, injuries, injections or other medical procedures.

Rarely *Sometimes* *Often* *Always*

19. Whenever possible, I avoid situations such as transportation, tunnels, bridges, elevators, flying, or enclosed places.

Rarely *Sometimes* *Often* *Always*

20. Whenever possible, I avoid social events, tests, and performance measures.

Rarely *Sometimes* *Often* *Always*

21. My reaction to certain animals or insects interferes with my routine, normal functioning or social activities.

Rarely *Sometimes* *Often* *Always*

22. My reaction to certain natural objects, events, or situations, such as storms, heights or water interferes with my routine, normal functioning or social activities.

Rarely *Sometimes* *Often* *Always*

23. My reaction to blood, injuries, injections or other medical procedures, interferes with my routine, normal functioning or social activities.

Rarely *Sometimes* *Often* *Always*

24. My reaction to situations such as transportation, tunnels, bridges, elevators, flying, or enclosed places interferes with my routine, normal functioning or social activities.

Rarely *Sometimes* *Often* *Always*

25. My reaction to social events, tests, or performance measures, interferes with my routine, normal functioning or social activities.

Rarely *Sometimes* *Often* *Always*

List the specific objects or situations that produce the most anxiety and distress:

_____

_____

_____

_____

IMPORTANT!!!! PLEASE READ BELOW!!!!!!

Our research team has developed ways to assist people in managing their anxiety around feared animals, such as insects, spiders or dogs. If you would like more information about this program, please write your name and phone number below and we will contact you within the next week.

Name _____

Phone(s) _____

Appendix B

Informed Consent Forms

Informed Consent

Project Title: Prevalence of Clinical Fears and Phobias in an Undergraduate Population

Investigator: Dr. Jones

I, _____ hereby certify that I have been informed about the research on assessing potentially distressful objects or situations. I have been told about the procedures, what my part in them will be, and the time involved for the experiment. I understand that there will be minimal risk involved in this research. I understand that any records that can identify me will be kept confidential.

I understand that I have the right to ask questions at any time and that I should contact Dr. Kevin Jones at 581-2128 for answers about the research.

My signature below indicates that I agree to participate. I also understand that I may refuse to participate or withdraw my consent and stop taking part in the research at any time without penalty or prejudice.

_____ _____

Participant Date

Print Name: _____

Social Security Number:_____

CONSENT FORM FOR STUDENT SUPPORT SERVICES

PARTICIPANT:_____BIRTHDATE:_____
ADDRESS:_____

_____

PHONE:_____

DESCRIPTION OF STUDY

You are being asked to participate in a program that is designed to treat / assess common fears and phobias. A potential benefit of this program is that your level of anxiety in the presence of feared objects may significantly decrease. The procedures will involve graduated steps toward a tarantula, with the continuous support of a highly trained graduate student. As a participant, you will be required to engage in the following activities:

1. Respond to questions about fears and complete fear rating scales that assess emotions.
2. Perform normal tasks, such as academic work, in the presence of a tarantula*.
3. Complete a hierarchy of tasks that begin with comfortable situations, such as looking at a picture of a spider, and proceed with situations of increasing discomfort, the most intrusive being to touch the inside of a tank containing the tarantula.

* "Presence of tarantula" = tarantula is in same room

The number of sessions will range from four to six. In some cases, a monetary incentive may be included for academic work. After the phases of the study are completed, a meeting will be arranged to discuss the outcomes. 2-3 weeks after assessment, follow-up consultation will be provided via telephone contact by Sarah Kerrick or Nicole Glover.

INFORMED CONSENT

I consent to participate in the program described above. I understand that all information will be kept in confidential only accessible by the assessment team. If this information is used for training and research purposes, all materials will receive a random code and there will be no way to link my name to any of these records. I may request copies of all materials and related reports at any time. I understand that I may terminate a session or my participation in the program at any time. Also, I may contact the supervisor of the program, Dr. Kevin Jones (217-581-2128) at any time to discuss progress or concerns.

Signed: _____ Date: _____

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Appendix C

Example Math Probe

MATH 5

Test #22
Password: FAN

Name: _____ Date: _____

A $\frac{1}{5} + \frac{13}{20} =$	**B** $\begin{array}{r} 7.479 \\ +\ 3.59 \\ \hline \end{array}$	**C** $\frac{14}{27} - \frac{4}{9} =$	**D** $\begin{array}{r} 3.64 \\ -\ 1.686 \\ \hline \end{array}$	**E** $\begin{array}{r} 185 \\ \times\ 32 \\ \hline \end{array}$
F $\begin{array}{r} .36 \\ \times\ .3 \\ \hline \end{array}$	**G** Reduce: $\frac{15}{20} =$	**H** $5 \times \frac{1}{5} =$	**I** Rename as mixed: $\frac{27}{8} =$	**J** $\begin{array}{r} 550 \\ \times\ 59 \\ \hline \end{array}$
K $\frac{2}{3} - \frac{3}{5} =$	**L** Round one place: $1.7 =$	**M** $8\frac{9}{11} - 5\frac{10}{11} =$	**N** Reduce: $\frac{3}{9} =$	**O** $4\overline{)521}$
P $\frac{2}{3} \times \frac{5}{7} =$	**Q** $\begin{array}{r} 2.51 \\ \times\ 6 \\ \hline \end{array}$	**R** $4\frac{8}{11} + 2\frac{5}{11} =$	**S** $70\overline{)74}$	**T** $\begin{array}{r} 91312 \\ -\ 38495 \\ \hline \end{array}$
U $\frac{1}{2} + \frac{1}{3} =$	**V** $28\overline{)566}$	**W** $\frac{2}{7} + \frac{6}{7} =$	**X** $\begin{array}{r} 13183 \\ 7263 \\ 2045 \\ +\ 356 \\ \hline \end{array}$	**Y** Rename as improper: $2\frac{3}{5} =$